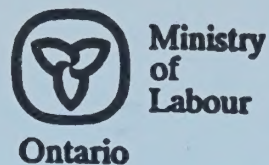


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INJURIES AND ILLNESSES IN ONTARIO WORKPLACES

STATISTICS AND ANALYSIS



Policy and Analysis Unit
Health and Safety Policy Branch
October 1991




Ministry
of
Labour

Ontario

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Injuries and Illnesses in Ontario Workplaces

Statistics and Analysis

Report prepared by:

Policy and Analysis Unit

Health and Safety Policy Branch

Ministry of Labour

October 1991

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MINISTRY OF LABOUR

MISSION STATEMENT

The Mission of the Ministry of Labour is . . .

*"To advance safe, fair and harmonious workplace practices
which are essential to the social and economic well-being
of the people of Ontario"*

OVERVIEW

WORKPLACE INJURY STATISTICS

Each year, Ontario workers suffer more than 400,000 injuries and illnesses which are directly related to their jobs. There is about one injury for every eleven workers covered under compensation. Every 18 seconds of work, someone in the province has an accident in the workplace. Not all of these injuries are serious. Some of these injuries, about one in every 20 workers covered under compensation, are disabling, resulting in the worker having to spend time away from work.

One worker died on the job every seven hours of work in 1990.

Benefits paid out by the Workers' Compensation Board related to injuries for lost wages, health care, rehabilitation and pensions amounted to \$2 billion in 1990 alone. This is only the direct costs of accidents.

The total dollar cost of workplace injuries and illnesses is conservatively estimated at over \$6 billion per year.

The financial and human costs of work-related injuries and illnesses have a major effect on the provincial economy, the labour force and industry's ability to compete. Over six million person-days of work are lost each year from injuries. The cost to the Ontario economy in lost production alone is estimated at over \$700 million each year.

Although there is a decline in the overall trend rate of lost-time injuries and fatalities in Ontario, the annual figures still remain too high, and this has led to public concerns that much of what is being done to prevent and reduce accidents and injuries may not be accomplishing the intended effect. Consequently, more detailed information on health and safety statistics is needed to consider new ideas and develop new approaches to ensure safe and healthy workplaces for Ontario workers.

Information is required on the source of work-related accidents and illnesses. There is also a need to know and understand in more detail why accidents occur, the frequency of occurrence, where they occur most often, and which industries and occupations are inherently more dangerous. If this and other pertinent information on the hazards faced by workers is available, then preventative programs can be targeted to those specific areas where the number of accidents and illnesses are highest.

This publication is intended to provide detailed information on work-related injuries and fatalities that may be of use in the development of policies and sector strategies for the prevention of accidents and injuries in Ontario workplaces. It will be revised from time to time as new and updated information becomes available.

Operations Activities of the Ministry of Labour

The Ministry of Labour is committed to the advancement of safe, fair and harmonious workplace practices which are essential to the social and economic well-being of the people of Ontario. Towards this commitment, the Ministry assists the efforts of workers and employers who share joint responsibility for occupational health and safety, and enforces the Occupational Health and Safety Act and regulations.

Ministry inspectors conduct routine inspections of workplaces; investigate complaints, critical injuries, serious accidents, work refusals, fatalities, and any potentially hazardous situations; order compliance with the Act and regulations and initiate prosecutions; and conduct pre-development reviews. The inspector also provides advice and mediation where there are disputes among the workplace parties.

In fiscal 1989/90 the Ministry...

- o conducted 68,827 workplace inspections for health and safety hazards. The decline in inspections over the five year period reflects the fact that workers and employers are **jointly** responsible for health and safety, and that inspections are now more complex and take much longer to complete.
- o issued 79,659 orders for violations of the Act and regulations. The decline in orders reflects the Ministry's new policy of not issuing repeat orders. Included were 3,737 stop-work orders involving closure of the workplace for more serious infractions.
- o investigated 3,723 complaints, 373 work refusals and a number of serious accidents, 87 of which were fatalities.
- o prosecuted 514 workplaces for violations of the Act, 371 of which resulted in convictions for a success rate of 72%, and total fines of about \$2.2 million.
- o conducted 4,538 consultations with workplace parties explaining new legislation, legislative changes, the roles and responsibilities of workers and employers, and changes to Ministry operating policies and procedures. In this way, internal problems can be resolved without the constant intervention of the inspector.

TABLE 1

MINISTRY OF LABOUR — SUMMARY OF OPERATIONS

	1985/86	1986/87	1987/88	1988/89	1989/90
Inspections Conducted	91,858	78,999	67,328	77,790	68,827
Orders Issued	76,381	65,730	65,711	90,504	79,659
Stop-Work Orders	2,393	2,558	2,774	4,074	3,737
Complaints Investigated	2,782	3,384	3,464	3,820	3,723
Refusals To Work Investigated	380	445	427	628	373
Fatalities Investigated	85	84	94	104	87
Prosecutions	248	291	417	510	514
Convictions	199	211	310	387	371
Fines (\$000's)	\$438.2	\$598.1	\$824.4	\$1,353.7	\$2,186.8
Consultations	2,931	3,282	3,003	3,080	4,538

How Safe Are Ontario Workplaces?

Here are some facts and figures...

- o More than 400,000 claims for injuries and illnesses sustained by workers on the job are filed with the WCB each year in Ontario. Some of these are relatively minor incidents in which the worker did not lose time from work beyond the day of the incident and, in most cases, received medical aid.
- o However, some of these claims, about 184,400 in 1990, involved disabling injuries which were serious enough for the injured worker to take time off work for at least one day.
- o The number of lost-time injuries reported by the WCB in 1990 represented a 9% improvement over the comparable figures for 1986. Despite this improvement however, the absolute levels of workplace accidents and injuries are considered to be still too high.
- o The lost-time injury rate, a measure which relates injury frequency to the number of workers in the workplace, fell from a rate of 4.5 per 100 workers in 1986 and 1987 to a rate of 3.7 per 100 workers in 1990. When adjusted for growth in the workforce, the injury data suggest that workplaces are not necessarily becoming more dangerous despite the relatively high absolute number of accidents.
- o Workplace injuries appear to be somewhat less severe today than in previous years. One measure of injury severity is the average number of days lost from work as a result of injuries arising out of an accident in the workplace. In Ontario, injured workers were off the job on average about 29.8 workdays (6.0 workweeks) per lost-time claim in 1989; a steady downward trend from the high of about 34 workdays (6.8 workweeks) per lost-time claim in 1986.

TABLE 2

WORKPLACE INJURIES AND ILLNESSES

	1986	1987	1988	1989	1990
Total Claims (000's)	442.1	469.7	487.7	473.8	449.6
Lost-time Injuries (000's)	203.2	209.2	208.5	201.0	184.4
Lost-time Injuries/Total (%)	46.0	44.5	42.8	42.4	41.0
LTI Rate (per 100 Workers)	4.5	4.5	4.3	4.1	3.7
Average Number of Days Lost (per lost-time claim)	33.8	32.8	31.1	29.8	N/A

Source: Workers' Compensation Board, Statistical Supplement to the Annual Report, 1990, and Statistics Canada, The Labour Force, Catalogue #71-001, Annual Averages.

The Most Hazardous Industries in Ontario

- o Workers injured on the job each year come from every economic sector. As might be expected, because of the nature of the job, a worker is more likely to get injured in a plant, factory, or other workplace in the manufacturing sector.
- o Lost-time injuries in Ontario manufacturing workplaces occurred at a rate of about 8.6 per 100 workers in 1989, the second highest rate among all industries in that year.
- o Other industries with relatively high injury rates are construction, mining, forestry and transportation.
- o The forestry industry, involving tree felling and logging operations, is especially hazardous with the highest injury rates over the five year period, 1985 to 1989. There were no major improvements in the safety record for this industry over the years, except for a significant decline in the injury rate 1988, a trend which was subsequently reversed in 1989.
- o Mining operations have experienced major safety improvements over the past five years. The injury rate for this industry has declined from a level of 5.3 injuries per 100 workers in 1985 to 4.1 per 100 workers in 1989; a rate which is comparable to the average for all industries.

TABLE 3

LOST-TIME INJURY RATES BY INDUSTRY DIVISION
(Per 100 Workers)

	1985	1986	1987	1988	1989
Forestry	18.4	16.0	12.7	8.3	10.2
Mining	5.3	5.1	5.1	4.9	4.1
Manufacturing	8.4	9.1	9.2	9.6	8.6
Construction	6.7	6.8	6.9	6.5	5.8
Transportation	3.3	3.4	3.6	3.7	3.0
Trade	2.3	2.5	2.5	2.5	2.5
Services	1.7	1.7	1.7	1.7	1.5
Public Administration	0.8	0.8	0.8	0.7	0.6
TOTAL	4.3	4.5	4.5	4.3	4.1

Source: WCB, Workplace Injury Information Retrieval System (W.I.R.S. System 54) and Statistics Canada, The Labour Force, Cat. 71-001, Annual Averages.
Agriculture industry is excluded.

Number of Lost Workdays in Ontario Industries

Another measure that is sometimes used to indicate the hazardous nature of an injury is the average number of workdays lost per lost-time claim filed by workers in that industry. The

length or duration of time that the worker is absent from work is an indication of the relative seriousness of injuries suffered in each industry. The more serious the injuries, the more hazardous the industry is considered to be.

- o Workers in the forestry industry experience some of the most seriously disabling injuries in Ontario workplaces. This industry sector accounts for less than 1% of total lost-time injuries, but these injuries tend to be very severe as evidenced by the fact that injured workers are frequently absent from work for long periods of time.
- o In 1988, the most recent year for which data are available, the average number of workdays lost per claim in tree felling and logging operations was about 71 (14 workweeks). This was more than twice the rate for all industries in that year and represented a significant deterioration over the years in time lost per injury claim from about 49 workdays (10 workweeks) in 1984.
- o Injuries appear to be also severe in the mining, construction, and transportation sectors, where injured workers are off the job for about 51 workdays (10 workweeks) on average. In construction, which has the worst record of the three industries, a large proportion of injuries are from slips and falls, which tend to keep workers incapacitated for longer periods of time.
- o Injuries occur more often in the manufacturing sector, but they appear to be less serious compared to other industries. The number of workdays lost from temporary total disabilities in manufacturing is fewer than 28 workdays (6 workweeks) per claim, which is the lowest injury severity rate for all industrial sectors.

TABLE 4

**AVERAGE NUMBER OF LOST WORKDAYS PER LOST-TIME CLAIM
(For Major Industry Divisions*)**

	1984	1985	1986	1987	1988
Forestry and Logging	49	51	70	71	71
Mining	53	54	57	56	47
Manufacturing	31	29	28	28	28
Construction	70	60	58	55	51
Transportation and Other Utilities	62	57	58	54	49
Trade	47	44	42	42	39
Services	36	34	35	34	32
TOTAL	36	34	34	33	31

Source: Advisory Council on Occupational Health and Occupational Safety (ACOHOS)
Eleventh Annual Report, April 1, 1988 - March 31, 1989, Appendix B, and
WCB, Workplace Injury Information Retrieval System (W.I.R.S., System 54).

* Excludes Agriculture, Fishing and Trapping, and the Public Sector.

OCCUPATIONAL INJURIES
DETAILED CLAIMS PROFILES

Injury Frequency and Age of Worker

It has been suggested that older, more experienced workers, have fewer occupational injuries than do younger workers. However, the duration of lost time is longer for older workers

and is consequently more costly. This should create an economic incentive for employers to take appropriate steps to reduce the incidence of occupational injuries among this group of workers.

- o In general, the statistics do suggest that the frequency of lost-time accidents tends to be highest among the younger and more inexperienced workers, particularly among those under 25 years of age, and those aged 25-34 years.
- o In terms of demographics, the largest labour force increases in the 1990s will be in the 25-44 age group as the baby boom cohort ages.
- o What this suggests is that as more workers move into this age group, specifically into the 25 to 35 age segment, the presently high injury rates experienced by this age category is likely to continue and may even worsen in future years.
- o The injury rate is virtually the same for workers in the age group 35-44 and 45-54 years. These workers experienced accidents at the rate of just over 3 per 100 workers in 1990, a rate which has remained fairly stable over the five year period, 1986-1990.
- o As indicated above, older workers, those age 55 years and over, have fewer accidents and injuries on the job than younger workers; as reflected in the relatively lower injury rate for this age group of 2.7 per 100 workers in 1990. One possible explanation is that older, more experienced workers tend to be more careful in avoiding risks on the job. At the same time however, they are believed to be more prone to musculoskeletal injuries and other occupational illnesses.

TABLE 5

LOST-TIME INJURY RATES BY AGE OF WORKER
(Per 100 Workers in Each Age Group)

Age Range (years)	1986	1987	1988	1989	1990
<25	4.8	4.8	4.7	4.2	3.9
25 - 34	4.7	4.8	4.8	4.5	4.3
35 - 44	3.6	3.7	3.6	3.4	3.3
45 - 54	3.7	3.6	3.5	3.2	3.1
+55	3.1	3.1	3.0	2.8	2.7
TOTAL FOR ALL AGE GROUPS	4.5	4.5	4.3	4.1	3.7

Source: Workers' Compensation Board (WCB), Statistical Supplement to the Annual Report, 1990, and Statistics Canada, The Labour Force, Cat. 71-001, Annual Averages.

Common Injuries and Diseases in Ontario Workplaces

- o Sprains and strains are the most common types of injuries faced by workers in Ontario workplaces. They account for one-half (50%) of all claims for lost-time injuries allowed by the Board for compensation in 1990. The frequency of these types of injuries has been stable over the past five years, but it is significant to note that as recently as 1983, sprains and strains accounted for about 30% of all lost-time claims, compared to 50% today.
- o It is also interesting to note that the ergonomic type illnesses, including inflammation or irritation of joints, tendons, muscles, nerves and arteries, accounted for only 1.3% of total claims in 1990. However, this represents a dramatic increase in these types of claims by over 400% from 1983, when they accounted for no more than 0.3% of all claims.
- o The increasing number of back injuries from sprains and strains and repetitive strain injuries (RSI) to the wrists, elbows and shoulders are expected to continue in the future with the changing nature of the workplace. The workplace is evolving from being manually intensive to an increasing reliance on technology. Frequently, this technology is introduced in the workplace without consideration for the human and organizational factors. Instead of technology being seen as a tool which complements the skill and expertise of the worker, the worker is, instead, quite often considered as an adjunct to the technology.
- o Other frequent types of injuries experienced in Ontario workplaces are contusions, 18.9% of all claims; cuts, lacerations and punctures (11.1%); fractures (3.9%), and scratches, abrasions (2.9%). These proportions have remained relatively constant over the most recent five year period.

TABLE 6
LOST-TIME CLAIMS BY NATURE OF INJURY AND DISEASE
(Expressed as Per Cent of Total Claims)

INJURIES:	1986	1987	1988	1989	1990
Sprains, strains	48.9%	49.4%	50.2%	49.5%	50.0%
Contusions, crushing, bruises	20.9%	20.3%	20.7%	19.4%	18.9%
Cuts, lacerations, puncture	12.8%	12.5%	12.4%	11.8%	11.1%
Fractures	4.6%	4.2%	4.0%	4.0%	3.9%
Scratches, Abrasions	3.4%	3.3%	3.2%	2.7%	2.9%
DISEASES:					
Inflammation or irritation of joints, tendons, muscles, nerves and arteries	1.1%	1.0%	1.0%	1.2%	1.3%
Burns (Chemical)	0.7%	0.7%	0.7%	0.7%	0.6%
Proportion of all Claims	92.4%	91.4%	92.2%	89.3%	88.7%

Source: Workers' Compensation Board, Statistical Supplement to the Annual Report, 1990.

Body Part Most Frequently Injured on the Job

Occupational back injury, which accounted for almost one-third (31%) of all lost-time claims in 1990, is the number one workplace health

and safety problem in Ontario. Each year, about 60,000 workers suffer back ailments on the job. The following statistics from the WCB outline the dimensions of the problem.

- o In 1987, the most recent year for which detailed information is available, the WCB awarded \$575 million in compensation and health care payments to workers for job-related back injuries sustained in 1987 and prior years. The average compensation awarded was about \$6,000 per claim and the average number of days lost was 47.5 days per claim.
- o The five leading occupations in terms of lost-time back claims in 1987 were: product fabricating, assembling and repairing (14%); service (10%), construction trades (9%); transport equipment operators (8%); and machinery and related (7%).
- o Younger workers have a higher incidence of back injuries than older, more experienced workers. Many factors act to cause back problems. One of these, a mismatch between worker capabilities and workload demand is a typical hazard and risk factor.
- o Workers in the age group 25-34 years are most susceptible to back injuries. In 1987, almost one-third (31.6%) of all lost-time back claims were filed by workers in this age category, followed by workers aged 35-44 years (22.7%) and those below age 25 (18.9%). Together, these three age groups accounted for 73% of all lost-time back claims filed with the Board in that year.
- o By comparison, 14.8% of all lost-time back claims in 1987 were filed by workers aged 45-54, while those 55 and over accounted for only 4.2% of back claims. This factor may partially explain the lower injury frequency in older workers.
- o About two out of every five (42%) lost-time claims filed with the WCB in 1990 were for injuries sustained by workers to the arms, hands, legs and feet (upper and lower extremities), which points to the need for improved safety in workplaces.

TABLE 7

LOST-TIME CLAIMS BY PART OF BODY INJURED
(Per Cent of Total Lost-Time Claims)

	1986	1987	1988	1989	1990
Back (including neck)	28.8%	29.2%	26.9%	28.8%	30.7%
Upper Extremities (arms and hands)	25.1%	25.1%	25.1%	23.9%	23.3%
Lower Extremities (legs and feet)	18.9%	18.5%	18.3%	17.8%	18.4%
Trunk (excluding back)	9.7%	9.8%	12.3%	9.6%	9.6%
Multiple parts	6.9%	7.0%	7.1%	7.6%	8.0%
Head	6.7%	6.5%	6.6%	6.2%	6.3%
Proportion of Total Lost-Time Claims	96.1%	96.1%	96.3%	93.9%	96.3%

Source: Workers' Compensation Board, Statistical Supplement to the Annual Report, 1990.

Major Types of Workplace Accidents in Ontario

- o Six main types of accidents account for about 90% of claims registered with the Workers' Compensation Board for lost-time injuries suffered in the workplace.
- o The most common accident type, and the main cause of back injuries in the workplace, is overexertion, resulting from lifting, pulling and pushing heavy objects. Overexertion was responsible for a little less than one-third (30%) of all lost-time claims in Ontario in 1990.
- o Almost one out of every five claims (18%) for lost-time injuries filed with the Board were from workers struck by an object, including falling and flying objects in the workplace.
- o The next major accident type is falls (14.7%), followed by involuntary bodily motion (14%), and workers caught up in machinery (6%).

TABLE 8

**LOST-TIME INJURY CLAIMS BY TYPE OF ACCIDENT
(Per Cent of Total Claims)**

TYPE OF ACCIDENT	1986	1987	1988	1989	1990
Overexertion	30.6%	31.6%	31.8%	31.0%	30.1%
Struck by Object	19.7%	19.9%	19.6%	18.8%	18.0%
Falls	14.4%	14.1%	14.0%	14.1%	14.7%
Involuntary Bodily Motion	13.5%	12.8%	13.1%	13.7%	14.0%
Caught in, Under or Between	7.4%	7.1%	7.2%	6.9%	6.2%
Struck Against	6.5%	6.2%	5.9%	6.1%	6.2%
SUB-TOTAL	92.1%	91.7%	91.6%	90.6%	89.2%

Source: Workers' Compensation Board, Statistical Supplement to the Annual Report, 1990.

Accident Rates and Worker Experience

Here are some observations...

- o The differences in injury rates among age groups can probably be explained by worker experience. Empirical studies conducted in the U.S. on trends in injury rates show that younger workers and inexperienced workers of all ages tend to have higher injury rates than older, more experienced workers.
- o The accompanying table shows the number of lost-time injuries by length of employment of the worker at the company where the injury occurs. A better measure of worker experience would have been the length of time spent by workers on the job they were doing at the time of the accident. This information is not available.
- o In 1987, the most recent year for which data are available, 29% of lost-time injuries occurred among workers who had less than one year's experience working with the company at the time of the accident. Workers with more than one, but less than two years working with the company accounted for 10% of lost-time injury claims in 1987.
- o The accident frequency declines sharply as years of experience with the company increases. A noticeable exception to this pattern is the accident frequency among workers who have been with the company between 5 to 9 and 10 to 14 years. This group accounted for a combined 22% of lost-time injuries in 1987.
- o This unusual development may have been the result of high levels of economic activity in Ontario during 1987 and the resulting lack of skilled workers, which forced employers to rotate workers among several different jobs and to hire older workers, many of whom may have been off work for long periods of time.
- o Some of these workers may not be fully aware of the hazards of the job or their safety habits may have deteriorated over time, and they may therefore be prone to accidents. Some may not have been provided with proper safety training for their new assignments. These factors, combined with long hours of work, increased overtime and shiftwork, may have contributed to the accident frequency among this group of workers.

TABLE 9

INJURY FREQUENCY BY YEARS OF EXPERIENCE AT COMPANY OF LAST EMPLOYMENT
(For the Year 1987)

Length of Employment (years)	Number of Lost-Time Injuries	Proportion of Total LTIs (%)
<1	61,030	29.2%
1	20,877	10.0%
2	13,487	6.4%
3	9,945	4.8%
4	6,049	2.9%
5 - 9	27,097	12.9%
10 - 14	19,637	9.4%
15 - 19	9,503	4.5%
+20	10,514	5.0%
Unknown	31,116	14.9%
TOTAL	209,255	100.0%

Source: WCB, Workplace Injury Information Retrieval System (W.I.R.S. System 57).

Severity of Workplace Injuries

A common measure of injury severity is the average number of days lost per non-fatal claim in which at least one day of lost time occurred. The data suggest that not only are more

workers getting injured on the job, but that they are staying away from work for longer periods of time on temporary disability.

- o Sprains and strains are not only the most frequent type of workplace injury, they are also the most disabling in terms of time spent away from the job.
- o For example, in 1988, sprains and strains accounted for one-half (50%) of all types of workplace injuries and 56.6% of total workdays lost from injuries. This amounted to about four million of the approximately seven million days lost from occupational injuries in 1988.
- o Injuries from sprains and strains have increased in severity over the years. The number of days lost from these types of injuries have increased from 42.9% of total days lost in 1984 to 56.6% in 1988. This is an average increase of about three percentage points a year over the five year period.
- o Contusions and bruises have also become increasingly severe injuries. In terms of time lost, these injuries accounted for 15% of total days lost from all types of injuries in 1988; this is about one in every seven days lost, up from about one in 11 days lost in 1984.
- o Other types of injuries such as fractures, cuts, lacerations, and multiple injuries have not increased in severity, when measured as a proportion of total days lost, but has remained relatively constant over the years.

TABLE 10

**MOST SERIOUS DISABLING INJURIES IN TERMS OF DAYS LOST
(Per Cent of Total Days Lost)**

NATURE OF INJURY	1984	1985	1986	1987	1988
Sprains, strains	42.9%	46.7%	51.8%	53.3%	56.6%
Contusions, Bruises	9.1%	12.3%	13.6%	14.7%	15.0%
Fractures	9.0%	8.2%	7.7%	8.2%	7.4%
Cuts, Lacerations	5.7%	6.1%	5.7%	6.2%	6.0%
Multiple Injuries	2.0%	1.9%	1.8%	1.7%	1.7%
Total of Five Injuries	68.8%	75.2%	80.7%	84.2%	86.8%

Source: WCB, Workplace Injury Information Retrieval System (W.I.R.S. System 54).

Some Hazardous Occupations in Ontario Workplaces

- o As one might expect, several broadly defined occupational categories in Ontario's goods producing industries employing mainly blue collar workers are relatively hazardous, in terms of the number of days lost from accidents and injuries per 100 workers.
- o Occupations in machining and related operations are among the most dangerous occupations in Ontario workplaces with the largest proportion of days lost from injuries suffered on the job. In 1988, machine operators who were injured at work were away from the job at the rate of about 43 days per 100 workers, a rate which has shown no improvement over the years.
- o Most construction workers are exposed to hazardous working conditions. This is reflected in the relatively high ratio of about 31 days lost per 100 workers for the construction industry in 1988. Nevertheless, this rate represented a significant improvement in time lost for these trades over the previous four years.
- o Occupations in transporting equipment operation, product fabricating, assembling and repairing, and material handling, also experience relatively high rates of days lost for injury claims. On the other hand, workers in processing, clerical and sales occupations suffer fewer disabling injuries as the number of days lost per 100 workers are relatively low compared to other occupations.

TABLE 11

**MOST HAZARDOUS OCCUPATIONS IN TERMS OF DAYS LOST FROM DISABLING INJURIES
(Per 100 Workers)**

OCCUPATIONS	1984	1985	1986	1987	1988
Machining and Related	43.5	43.5	45.5	40.1	42.9
Construction Trades	43.1	41.2	39.3	36.0	31.1
Transport Equipment Operating	37.7	34.9	38.6	32.9	30.9
Product Fabricating, Assembling and Repairing	20.2	22.0	23.0	23.0	24.0
Material Handling and Related	21.2	19.3	20.1	20.3	20.9
Services	10.9	11.0	11.3	11.8	11.0
Medicine/Health	11.4	11.5	13.3	10.9	9.5
Processing	6.3	6.3	6.7	6.6	6.2
Clerical and Related	3.3	3.5	3.6	3.7	3.5
Sales	3.5	40.0	4.2	3.9	3.3

Source: WCB, Workplace Injury Information Retrieval System (W.I.R.S. System 54),
and Statistics Canada, Labour Force, Annual Averages, Cat. 71-529.

Injury Rates For Selected Manufacturing Sectors

Injury rates are made available by the Workers' Compensation Board for key sectors in manufacturing. This is a useful basis for comparing safety in these diverse workplaces.

There is a significant underlying trend in the data that should be noted. The lost-time injury rate for virtually all of these key manufacturing sectors have been increasing steadily over the five year period, 1984-1988.

- o The data suggest that among all the major manufacturing sub-sectors, foundries have the worst safety record, with a lost-time injury rate of 24.9 accidents per 100 workers in 1988, the most recent year for which statistics are available. This was a significant deterioration from the rate of 19.3 per 100 workers in 1984.
- o Other hazardous workplaces with relatively high injury rates include woodworking, steel fabrication and abattoirs. These sub-sectors have shown no improvements in the relatively high accident rates per 100 workers since 1984.
- o The safety record in quarries, including cement, brick and glass works, and the automobile and farm implements sub-sectors, have also deteriorated steadily over the years, with injury rates of about 11 accidents per 100 workers in 1988, up from about 8 per 100 workers in 1984. Metal manufacturing and textiles are two sub-sectors whose safety records have also worsened over the period since 1984.
- o Most other sectors, including publishing and printing and the chemical industries, appear to have relatively good safety records, with low and somewhat stable injury rates over the years.

TABLE 12

**LOST-TIME INJURY RATES FOR SELECTED MANUFACTURING SECTORS
(Per 100 Workers)**

	1984	1985	1986	1987	1988
Foundries	19.3	21.1	21.3	21.8	24.9
Woodworking	10.4	11.2	12.9	12.6	17.8
Abattoir, Meat Packing	15.1	15.5	15.9	15.8	15.2
Steel Fabrication (incl. shipbuilding)	13.0	13.1	15.1	15.3	14.3
Automotive and Farm Implements	9.9	10.5	10.7	10.6	11.1
Quarries, Cement, Brick, Glass	7.9	8.4	8.8	9.5	11.4
Food Products	7.6	8.0	8.4	8.6	8.6
Metal Manufacturing	6.4	7.0	7.5	7.8	8.6
Tanneries, Leather, Rubber	7.6	8.0	8.1	8.1	8.5
Textiles	5.5	6.3	6.3	6.7	8.0
Iron and Steel, Abrasives	5.5	5.9	5.9	6.2	6.7
Clothing	4.7	4.9	5.1	5.1	6.2
Milling, Fertilizer and Grain	5.9	5.9	5.8	6.1	5.2
Printing and Publishing	3.8	4.1	4.2	4.1	4.9
Chemical Industries	3.2	3.1	3.0	3.1	3.5

Source: Figures are estimates prepared from data provided by the WCB.

Injury Rates by Size of Firm

- o Statistics for 1987, the most recent year for which data are available, suggest that injury rates in Ontario industries vary significantly by establishment size. In general, injury rates per 100 workers, for establishments with fewer than 50 workers or with 500 or more workers were lower than rates for mid-size firms.
- o But this pattern varied somewhat by industry divisions. For example, small employers (fewer than 50 workers) in the mining and construction industries had a higher injury rate per 100 workers than larger employers within the industry. The exception to this pattern was the sharp increase in injury rates for mid-size firms of employment size 50 to 99 workers in both industries.
- o Another exception to the general pattern was in forestry, where except for the very small firms (fewer than 5 employees), the injury rate per 100 workers increased with firm size. The largest firms, i.e., those with 500 or more workers, are very hazardous, with a frequency rate more than twice that of firms in other employment size groups in the industry.
- o For all industries, the data suggest that medium sized firms employing between 50 and 99 workers, are the most hazardous in terms of the number of injuries suffered by workers in these workplaces, followed by large firms employing between 100 and 499 workers. The very large firms, those with 500 or more workers, appear to be the safest with the lowest injury frequency.

TABLE 13

INJURY RATES BY SIZE OF FIRM AND INDUSTRY DIVISION
(Per 100 Workers, 1987)

INDUSTRY DIVISION	SIZE OF FIRM (NO. OF WORKERS)						Composite Industry Average
	1-5	6-19	20-49	50-99	100-499	+500	
Forestry	15.3	6.3	14.1	21.3	21.6	45.8	12.7
Mining	27.3	10.0	9.5	13.0	6.5	4.0	5.1
Manufacturing	16.5	9.7	7.4	13.3	10.8	4.8	9.2
Construction	7.0	5.6	4.8	8.4	4.4	1.1	6.9
Transportation	6.1	5.8	5.3	11.1	8.3	1.1	3.6
Trade	1.4	1.5	1.7	3.3	2.7	2.8	2.5
Services	1.0	1.1	1.3	2.9	2.4	1.4	1.7
Public Administration	2.2	1.9	1.8	2.1	4.4	0.2	0.8
TOTAL DIVISIONS	3.6	3.3	3.3	6.7	5.8	2.3	4.5

Source: Statistics Canada, Small Business and Special Survey Division, Ottawa, 1987, and WCB, Workplace Injury Retrieval System (W.I.R.S. System 54).

Work Injuries in Ontario and the Other Provinces

There are some differences among provincial WCB's in the way that injury and fatality claims are counted and compensated, which makes direct inter-provincial comparison less meaningful. In the absence of a national system

of injury statistics, Statistics Canada has collected and published provincial statistics which allow for some general conclusions about workplace health and safety among jurisdictions.

- o Ontario workplace safety record compares favourably with other provinces, measured in terms of the disabling (lost-time) injury rate per 100 workers at risk, over the five year period, 1985 to 1989.
- o Based on the number of people working, Ontario, with 40% of the Canadian workforce and about two out of every three jobs in the goods producing sector, had a rate of 5.0 disabling injuries per 100 workers at risk in 1989, one percentage point below the national average. Only Saskatchewan and Alberta had a better performance in that year.
- o Over the five year period, 1985 to 1989, the disabling injury rates in Quebec and British Columbia have remained well above the national average. Whereas Quebec has shown some slight improvement in injury experience, there was a worsening of the safety record in British Columbia, Newfoundland, and Nova Scotia over the period.

TABLE 14
WORK INJURY EXPERIENCE BY PROVINCE
(Disabling Injuries per 100 Workers)

	1985	1986	1987	1988	1989*
Newfoundland	6.8	6.3	6.5	6.8	8.8
P.E.I.	5.8	4.8	5.6	6.3	6.3
Nova Scotia	4.5	4.5	3.9	8.7	9.6
New Brunswick	5.7	5.3	4.6	5.2	5.4
Quebec	8.7	8.8	8.7	8.5	8.5
Ontario	5.0	5.1	5.0	5.1	5.0
Manitoba	6.2	5.6	5.8	5.6	5.4
Saskatchewan	5.7	4.5	4.9	4.8	4.3
Alberta	5.3	5.0	5.0	5.0	4.8
British Columbia	6.4	6.3	6.3	6.8	7.1
Canada	6.2	6.1	6.0	6.3	6.3

* 1989 data are preliminary.

Source: Labour Canada, Employment Injuries and Occupational Illness, 1985-87, Cat. L151-2068/90B, and Occupational Injuries and Their Cost in Canada, 1987-89, Cat. L151-2238/91B, 1991.

OCCUPATIONAL FATALITIES

Some Facts About Fatalities In Ontario Workplaces

The main source of information on occupational fatalities in Ontario is the number of fatal claims allowed by the WCB each year. Fatal claims refer to all claims where a death has occurred and fatal benefits are being claimed. Some fatal claims submitted to the Board are rejected, only those that are allowed by the Board as legitimate work-related deaths and accepted for compensation are included in the fatality count.

Fatal claims are classified into the following categories:

- occupational diseases: the worker died as a consequence of an occupational disease
- immediate deaths: the worker had an accident at work and died the same day
- not immediate deaths: the worker had an accident at work and died at a later date as a consequence of the injuries
- 100% disability pension: the worker who died was receiving a pension with a 100% disability rating.

- o Between 1986 and 1990, a total of 1,391 Ontario workers were killed on the job as a result of injuries or illnesses sustained in the workplace, or from conditions in the work environment. This figure includes fatalities in road accidents and farming operations.
- o The total number of workplace fatalities varies from year to year, but appears to have peaked at about 332 deaths in 1988. In 1989, there were 25 fewer fatalities than the year before, and in 1990, fatalities declined even further by 38 from the 1989 level.
- o The fatality rate, which relates the number of deaths each year to the workforce in that year, has also declined steadily from the peak in 1988. The fatality rate in Ontario declined from a level of 6.8 deaths per 100,000 workers in 1988 to about 5.4 deaths per 100,000 workers in 1990, a decline of 20.6%.
- o Over one-half (54%) of all job-related fatalities in Ontario are the result of traumatic accidents in which the worker is either killed instantly (44%); or dies at a later date from the injuries sustained in the accident (10%).

TABLE 15

FATALITIES IN ONTARIO WORKPLACES
(Number, Rate per 100,000 Workers and Category of Claims)

	1986	1987	1988	1989	1990
Total Number of Fatalities	225	258	332	307	269
Incidence Rate per 100,000 Workers	5.0	5.5	6.8	6.2	5.4
Fatal Claims by Category:			1988	1989	1990
Diseases			98 (30%)	87 (28%)	77 (29%)
Immediate Deaths			141 (42%)	128 (42%)	119 (44%)
Not Immediate Deaths			21 (6%)	31 (10%)	28 (10%)
100% Pensioners			72 (22%)	61 (20%)	45 (17%)
TOTAL			332 (100%)	307 (100%)	269 (100%)

Source: WCB, Statistical Supplement to the Annual Report, 1990.

Age of Worker and Workplace Fatalities

- o Statistics that provide the age of fatally injured workers suggest that although older workers may in fact experience fewer injuries on the job, a higher proportion of these injuries prove to be fatal.
- o For example, a frequency distribution of workplace fatalities by age groups, shows that older workers, those aged 55 years and over, experience a higher rate of fatal injuries compared to younger workers.
- o The fatality rate among workers aged 55 and over, of about nine deaths per 100,000 workers, is nine times higher than the rate for younger workers and at least three times higher than any other age group.
- o Alternatively, younger workers have higher injury rates, (4.3 per 100 workers aged 25-34 compared to 2.7 per 100 workers 55 years and over) but relatively fewer fatalities. For example, the fatality rate among workers aged 25-34 years is estimated at 2.5 per 100,000 employees.

TABLE 16

FATALITY RATES BY AGE OF WORKER
(Per 100,000 Employed Workers)

Age Range	1984	1985	1986	1987
<25	1.8	1.4	1.6	1.3
25 - 34	2.7	2.5	2.1	2.5
35 - 44	2.5	2.5	3.4	3.6
45 - 54	2.6	4.3	3.1	3.3
+55	9.3	7.5	11.9	9.1

Source: WCB, Workplace Injury Information Retrieval System (W.I.R.S. System 57),
and Statistics Canada, The Labour Force, Cat. 71-001, annual averages.

Major Causes of Fatalities in Ontario Workplaces

- o Injuries from sharp blows to the body, such as contusions, crushing and bruising are by far the major causes of deaths in Ontario workplaces. These factors account for one-half of all job-related fatalities in the province and are the leading causes of workplace deaths throughout all sectors of the economy.
- o Contusions account for one out of five (19%) job-related injuries and 52% of fatalities, whereas sprains and strains, which account for one-half (50%) of all workplace injuries, account for only about 3% of all fatalities.
- o Occupational illness and disease is the cause of death in about one-quarter of all workplace fatalities. It is generally believed that occupational disease may indeed be the leading cause of death in Ontario workplaces but is under-reported. Also, disease claims are rejected by the WCB at a much higher rate than accident claims. This is due in part to the difficulty of classifying occupational illnesses because of the long latency period often involved and the causal relationship to the environment and lifestyle.

TABLE 17

MAJOR CAUSES OF WORKPLACE FATALITIES
(Per Cent of Total Fatalities)

	1984	1985	1986	1987
Contusion, Crushing, Bruising	58.5%	59.2%	45.6%	51.9%
Occupational Illnesses	21.6%	19.7%	28.5%	25.9%
Electric Shock, Electrocuting	2.8%	5.1%	4.1%	4.3%
Multiple Injuries	3.4%	0.0%	1.0%	2.7%
Asphyxia, Strangulation, Drowning	2.8%	3.8%	2.6%	2.2%
TOTAL OF FIVE MAJOR CAUSES	89.2%	87.9%	81.9%	87.0%

Source: WCB, Workplace Injury Information Retrieval System (W.I.R.S. System 54).

Fatalities Resulting From Traffic Accidents

Fatality statistics published by the WCB include fatal claims allowed by the Board arising from motor vehicle accidents that occur during the course of work.

Fatal claims published by the Ministry of Labour do not include deaths from traffic accidents, as these incidents are usually not investigated by Ministry inspectors.

- o Traffic accidents on public roads in Ontario account for about 10% of total occupational fatalities in the province each year. This amounted to a total of approximately 186 deaths over the five year period, 1985-1989.
- o Collisions (head-on collisions, collisions at intersections and other collisions) were the leading type of traffic accidents, accounting for 85 (45%) of the 186 deaths over the five year period.
- o Another leading type of traffic accident is overturned vehicles and vehicles which run off the highway. This category accounted for a total of 53 deaths over the five year period, 1985-1989. In the majority of cases, the accident was due to truck drivers who fell asleep at the wheel or who experienced bad driving conditions.
- o Workers struck by vehicle is another substantial category. Detailed information on the circumstances surrounding these accidents is not available.

TABLE 18

FATALITIES RESULTING FROM TRAFFIC RELATED ACCIDENTS

TYPE OF ACCIDENT	1985	1986	1987	1988	1989	Total 1985-1989
Other Collisions	10	6	3	7	8	34
Vehicle Overturned	5	3	13	3	5	29
Head-on Collision	6	3	7	6	5	27
Collision at Intersection	4	4	4	9	3	24
Run-off Roadway	4	6	5	7	2	24
Struck by Vehicle	2	9	3	3	5	22
Train Accidents	1	2	0	0	2	5
All Other/Unspecified	2	8	4	5	2	21
TOTAL	34	41	39	40	32	186

Source: Workers' Compensation Board, W.I.R.S. System 57.

Fatalities and Years of Experience on the Job

- o Data available from the Workers' Compensation Board for 1987, suggests that workers who have had many years of experience doing the same job may be just as prone to fatal accidents as workers who are relatively new to the job.
- o In 1987, for example, the proportion of occupational fatalities among workers with less than a year's experience on the job at the company of last employment was about the same as the proportion of fatalities among workers with 20 or more years of experience on the job.
- o It would seem that workers, irrespective of age, who are new to the job may not have been properly trained in the tasks to be performed. This would include young workers during their first year of employment and older workers who may be asked to perform different jobs with little or no training.
- o The high proportion of fatalities among workers with many years of experience on the same job may be attributed to either decreased vigilance in the safety aspects of the job, or more likely, to a higher incidence of occupational illnesses and disease among this group of workers.

TABLE 19

FATALITIES BY YEARS OF EXPERIENCE AT COMPANY OF LAST EMPLOYMENT
(For the Year 1987)

Length of Employment (years)	Number of Fatalities	Proportion of Total (%)
<1	28	13.5%
1	12	5.9%
2	5	2.2%
3	3	1.6%
4	1	0.5%
5 - 9	12	5.9%
10 - 14	7	3.2%
15 - 19	6	2.7%
+20	29	14.1%
Unknown	105	50.3%
TOTAL	209	100.0%

Source: WCB, Workplace Injury Information Retrieval System (W.I.R.S. System 57).

Fatality Rates in Ontario and Other Provinces

As in the case of workplace injuries, it is also difficult to compare fatality rates among provinces because of differences in the way that fatal claims are accepted and allowed for compensation purposes by each provincial WCB. Another significant factor that must be taken into account when comparing provincial fatality

rates, is the wide diversity and mix of industrial activity among provinces. For example, Ontario has 40% of the workforce and two out of every three manufacturing jobs, compared to British Columbia, where forestry and logging activities predominate, and the Prairie provinces where agriculture is the main industrial activity.

- o Statistics published by Labour Canada on **compensated** fatal claims by province, indicate that Ontario is well placed among the provinces in terms of safety on the job, even though the fatality rate for Ontario is shown as increasing over the five year period (Note: The Ministry uses **allowed** fatal claims to estimate fatality rates for Ontario).
- o It is not immediately clear as to the cause of the relatively high fatality rates in Newfoundland. High fatality rates in British Columbia can be mainly attributed to the forestry and logging industries which are inherently dangerous.
- o The fatality rate in Ontario workplaces over the five year period, 1985-1989, averaged 5.9 deaths per 100,000 workers, compared to the average of 6.3 deaths per 100,000 workers in Quebec, 12.4 per 100,000 workers in Alberta and 13.6 per 100,000 workers in B.C.
- o During 1985-1989, about half of all provinces showed some improvements in workplace safety as evidenced by the steady decline in fatality rates over the period. The other half, including Ontario, either showed no improvement or, in some cases, a significant deterioration.

TABLE 20

FATALITY RATES BY PROVINCE
(Per 100,000 Workers*)

	1985	1986	1987	1988	1989*
Newfoundland	23.4	14.5	15.0	12.9	17.9
P.E.I.	9.7	2.5	8.2	0.0	10.3
Nova Scotia	6.1	8.2	2.4	9.5	7.5
New Brunswick	8.1	8.2	29.9	32.7	3.5
Quebec	8.0	7.2	5.3	4.7	6.2
Ontario	4.5	5.2	6.3	6.7	7.0
Manitoba	8.2	8.4	6.8	6.3	5.0
Saskatchewan	8.6	7.9	8.6	7.3	11.3
Alberta	13.6	14.0	10.8	12.9	10.7
British Columbia	13.0	11.9	13.1	14.7	15.3
Canada	8.0	7.7	7.9	8.4	8.3

* 1989 data are preliminary.

The fatality rate is based on total compensated fatalities in each year. This explains the unusually high rates in New Brunswick in 1987 and 1988, and the anomaly of a zero rate for P.E.I. in 1988. The Ministry of Labour uses the number of fatalities allowed each year by the WCB to prepare estimates of fatality rates for Ontario. This presents a truer picture of workplace fatalities and reflects a lower fatal rate for Ontario as shown in Table 15, page 31.

Source: Labour Canada, Employment Injuries and Occupational Illnesses, 1985-87, Cat. L151-2068/90B, Ottawa, and Occupational Injuries and their Cost in Canada, 1987-89, Cat. L151-2238/91B, 1991.

Fatality Rates in Ontario and Other Industrial Economies

The International Labour Organization (ILO) publishes fatality statistics for a number of countries, including Canada. The data however, cannot be directly compared as there are

significant differences among major jurisdictions in how the statistics are measured, collected, recorded and reported. Because of these differences, care must be taken in interpreting the ILO data.

- o Data published by the ILO for the years 1983-1987, suggest that Ontario is well placed among major industrial economies, such as West Germany, and the United States, in terms of the number of workplace fatalities.
- o Fatality rates reported by the ILO for the United Kingdom are unusually low, compared to other jurisdictions. It is not clear at this time whether the differences are real or due to statistical measurement and reporting practices in the U.K.

- o Similarly, it is uncertain whether the high fatality rates for West Germany reflect differences in the way that deaths from occupational injuries and illnesses are recorded and reported in that country.
- o The ILO data also suggest that fatality rates in Ontario and the other major industrialized economies have been improving over the five year period, 1983-1987. Fatality rates for each jurisdiction have trended downwards with the most significant turnaround in West Germany.

TABLE 21

FATALITY RATES IN ONTARIO AND OTHER INDUSTRIAL ECONOMIES
(Per 100,000 Workers in the Industrial Sector*)

	1983	1984	1985	1986	1987
Ontario	6.3	6.2	4.8	5.0	5.5
Canada	8.7	8.2	8.4	6.9	7.5
West Germany	13.0	12.0	10.0	8.0	n/a
United Kingdom	2.2	2.1	1.9	1.7	1.7
Sweden*	4.8	3.8	3.2	3.6	3.4
United States*	5.6	6.4	6.2	6.0	5.4

* The US and Sweden report fatality rates per million manhours. These were converted to rates per 100,000 workers using 2,000 hours as the baseline for one fulltime worker/year.

Fatality rates include deaths from occupational diseases. The data for Sweden and Canada includes deaths from commuting accidents (i.e., accidents on the way to and from work).

Fatality rates are compensated claims in Canada and Ontario but are reported claims in all other countries.

Source: ILO Annual Statistical Yearbook, 1989-90, (Geneva), and Ontario WCB, Workplace Injury Retrieval System, (W.I.R.S. System 54).

COSTS OF OCCUPATIONAL ACCIDENTS

Costs of Workplace Accidents and Illnesses

The cost of workplace injuries and diseases is of concern to the workplace parties in Ontario. These costs are not well understood, but they are believed to be significant. The costs of occupational accidents are generally associated with payments made by the Workers' Compensation Board to injured workers for lost income, rehabilitation and medical expenses.

However, these expenses, referred to as direct costs, constitute only a relatively small portion of the total costs of an accident. There are other significant economic, human, and social costs, called indirect costs, that are related to various incidents surrounding the accident. Employers are not always fully aware of these additional costs and the economic benefits of accident prevention.

- o In 1990 alone, the WCB paid out a total of \$2.0 billion in benefits to compensate workers for occupational injuries and diseases and to pay for medical treatment and rehabilitation. Over the most recent five year period, 1986-1990, these costs have amounted to a total of \$ 8.1 billion in compensation for disabling and fatal injuries. But these are only the **direct costs**.
- o It is believed that the hidden or **indirect costs** of workplace accidents can be anywhere between 2 to 10 times the direct cost. This would put the total costs in 1990 for work-related accidents and diseases in Ontario anywhere between 6 to 22 billion dollars.
- o The cost of compensation is borne by employers through levies based on payroll and industry classification. In 1990, these assessments amounted to \$2.6 billion, an increase of just under \$1.0 billion since 1986.
- o Over 6 million days of production are lost each year from job-related injuries and illnesses in Ontario workplaces. By comparison, this is about four times the number of workdays lost from labour disputes.
- o This is costing Ontario employers more than \$700 million each year in lost output and production.

TABLE 22

ESTIMATED COSTS OF WORKPLACE ACCIDENTS AND ILLNESSES IN ONTARIO

	1986	1987	1988	1989	1990
Benefits Paid Out (\$ billions)	\$1.2	\$1.5	\$1.6	\$1.8	\$2.0
Indirect Costs (\$ billions)*	\$2.4-\$12.0	\$3.0-\$15.0	\$3.2-\$16.0	\$3.6-\$18.0	\$4.0-\$20.0
Estimated Total Costs (\$ billions)	\$3.6-\$13.2	\$4.5-\$16.5	\$4.8-\$17.6	\$5.4-\$19.8	\$6.0-\$22.0
Assessments (\$billions)	\$1.7	\$2.1	\$2.4	\$2.7	\$2.6
Total Workdays Lost (millions)	6.9	6.9	6.7	6.0	n/a
Cost of Lost Output (\$ millions)**	\$678.2	\$707.1	\$714.8	\$702.0	n/a

Source: WCB, Annual Reports and Statistics Canada "Employment, Earnings and Hours", Cat. #71-002.

* Empirical studies, conducted mainly in the U.S., have developed estimates of the ratio of indirect to direct costs of workplace accidents ranging from a low of 2:1 to a high of 10:1.

** Estimates based on calculations using the average industrial wage in Ontario.

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